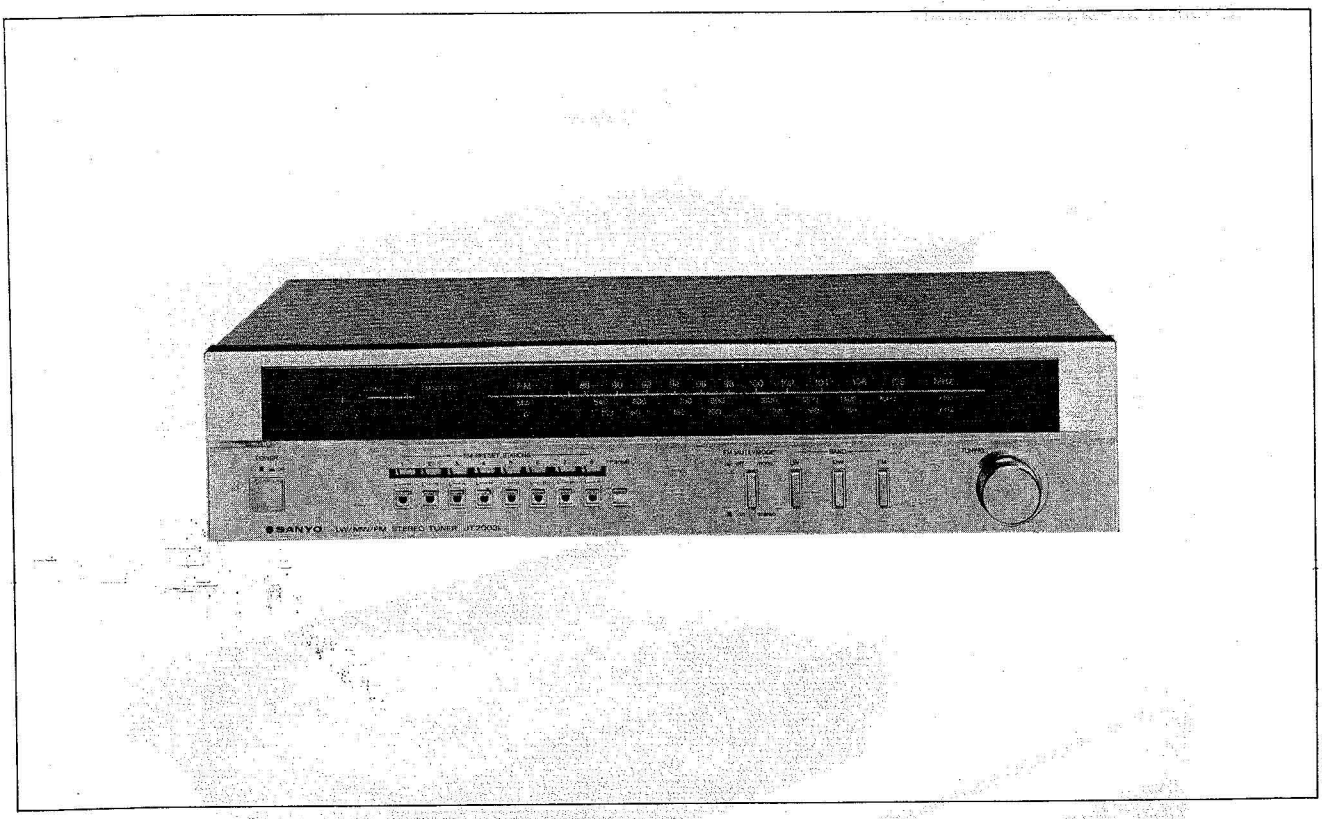
SERVICE MANUAL

STEREO TUNER

SANYO

JT 2003LP

(EUROPE)



SPECIFICATIONS

NOTE:
The below mentioned specifications are mainly based on the IHF measurements standard. They can therefore not directly be compared with specifications based on the DIN standard or other standards.

FM section

Frequency range	87.5 – 108 MHz
Usable sensitivity	
Mono	1.2 μV
Signal to noise ratio (1 mV ANT.)	
Mono	70 dB
Stereo	65 dB
Harmonic distortion (1 kHz)	
Mono	0.2%
Stereo	0.25%
Frequency response	30 Hz – 15 kHz
Alternate channel selectivity	70 dB
AM suppression	55 dB
Stereo separation (1 kHz)	40 dB
Spurious rejection	60 dB
Image rejection	50 dB
IF rejection	85 dB
Aerial input	75 ohms unbalanced

AM (MW and LW) section

Frequency range	MW: 522 – 1620 kHz
	LW: 150 – 285 kHz
Sensitivity (ferrite aerial)	MW: 300 μV/m, LW: 500 μV/m
Signal to noise ratio (5 mV/m)	MW: 42 dB, LW: 40 dB
Selectivity	28 dB
Image rejection	MW: 50 dB, LW: 40 dB
IF rejection	39 dB
Aerial	Ferrite bar aerial and external aerial socket

General

Power requirements	AC: 220 V, 50 Hz
Power consumption	11 W
Dimensions (Approx.)	420 (W) x 250 (D) x 88 (H) mm
	(16-1/2" x 9-13/16" x 3-1/2")
Weight (Approx.)	3.5 kg (7 lbs. 11 ozs.)

* Specifications subject to change without notice.

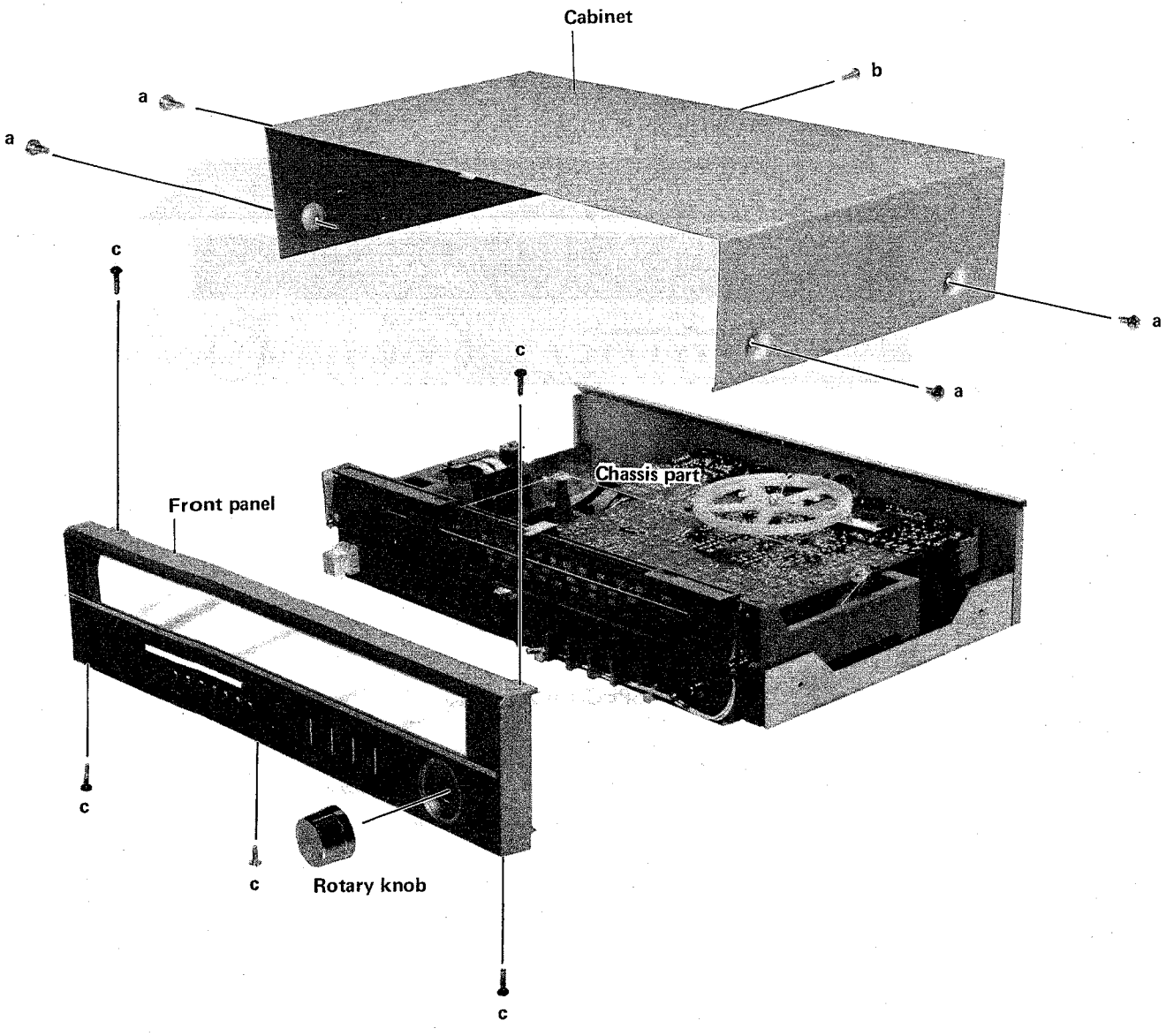
How to Remove the Panel

Pull out the power cord from outlet.

1. Cabinet
   Remove four screws "a" (binding head tapping screw 4 x 8 mm) and "b" (binding head tapping screw 3 x 8 mm) securing the cabinet.
   Lift the cabinet, and take it down.
2. Front panel
   Pull out rotary knob.
   Remove five screws "c" (binding head tapping screw 3 x 12 mm) securing the front panel.

Fitting of front panel

1. Set all push buttons in the OFF state.
2. Put push buttons into button holes of front panel in turn from the POWER switch button side. If a button does not go into the front panel hole, move the joint of the pertinent button to agree it with front panel hole.



a: Binding Head Tapping Screw 4 x 8 mm
b: Binding Head Tapping Screw 3 x 8 mm
c: Binding Head Tapping Screw 3 x 12 mm

Tuner Adjustment

- Apply 220 V AC, 50 Hz as power source.

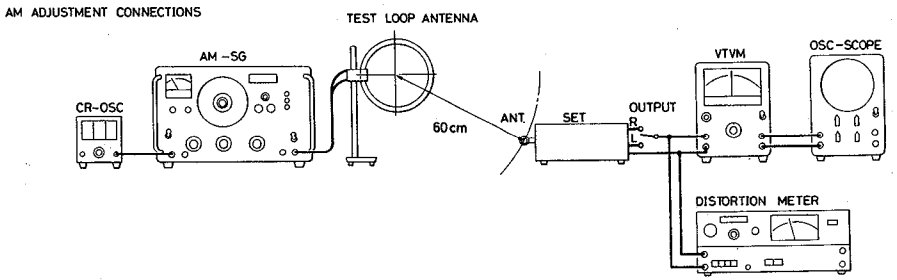
Standard modulation frequency MW: 1000 Hz
LW: 400 Hz

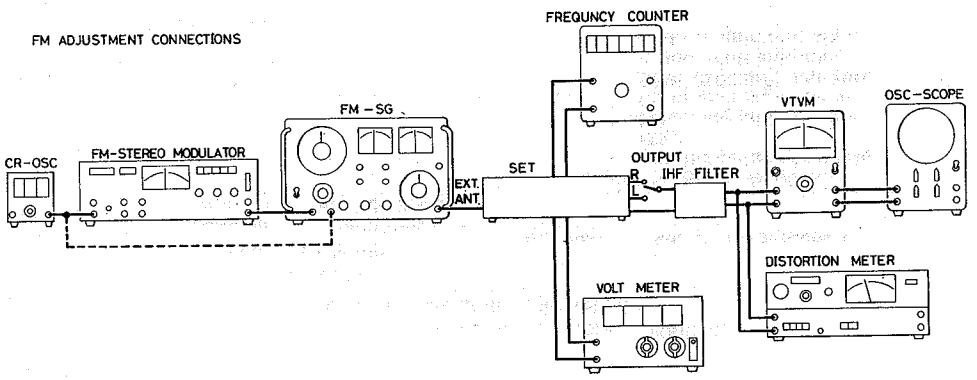
AM • Set band selector to MW or LW.

Percentage modulation 30%

Step	Adjustment circuit		Position of tuning dial	Input conditions for measuring instrument			Output conditions for measuring instrument			Adjustment	Adjustment procedure
				Measuring instrument (Frequency)	Input strength	Connecting point	Measuring instrument	Connecting point Hot side	Earth side		
1	IF (MW)		Low end (Where no incoming signals.)	AM Sweep generator 460 kHz (Non modulation)	Should be no distortion immediately before signals are saturated.	TP151 (H) TP102 (E) & AM Loop antenna	Oscilloscope AC Vacuum-tube Volt-meter Distortion meter	R262	TP203	T151 T251 T252	• Adjust to the minimum distortion with the output being at the maximum.
2	LW Cover frequency	Low	140 kHz	AM Signal generator 140 kHz	Proper	AM Loop antenna	Oscilloscope AC Vacuum-tube Volt meter Distortion meter	OUTPUT Terminal		L153	• Tune in SG and the unit, and adjust to the minimum distortion with the output being at the maximum.
		High	300 kHz	AM Signal generator 300 kHz						CT153	
3	LW Tracking	Low	160 kHz	AM Signal generator 160 kHz	Proper	AM Loop antenna	Oscilloscope AC Vacuum-tube Volt meter Distortion meter	OUTPUT Terminal		L155	• Tune in SG and the unit, and adjust to the minimum distortion with the output being at the maximum.
		High	280 kHz	AM Signal generator 280 kHz						CT151	
4	MW Cover frequency	Low	510 kHz	AM Signal generator 510 kHz	Proper	AM Loop antenna	Oscilloscope AC Vacuum-tube Volt meter Distortion meter	OUTPUT Terminal		L154	• Tune in SG and the unit, and adjust to the minimum distortion with the output being at the maximum.
		High	1650 kHz	AM Signal generator 1650 kHz						CT154	
5	MW Tracking	Low	600 kHz	AM Signal generator 600 kHz	Proper	AM Loop antenna	Oscilloscope AC Vacuum-tube Volt meter Distortion meter	OUTPUT Terminal		L152	• Tune in SG and the unit, and adjust to the minimum distortion with the output being at the maximum.
		High	1400 kHz	AM Signal generator 1400 kHz						CT152	
6	Signal indicator		Near 1000 kHz	AM Signal generator 1000 kHz	110 dB	AM Loop antenna	Signal LED	–		SVR251	• Adjust until the fifth LED is lit.

NOTES
1. Adjust in the numerical order of steps; otherwise specified performance may not be obtained.
2. Adjust on an iron plate.
3. Since the tracking adjustment of LW may deviate the cover frequency, adjust the both characteristics at the same time.
4. Use nonmetallic screwdriver for adjustment.
5. L152 and L155 are secured with paraffin. Melt and rotate.





FM ● Set band selector to FM.

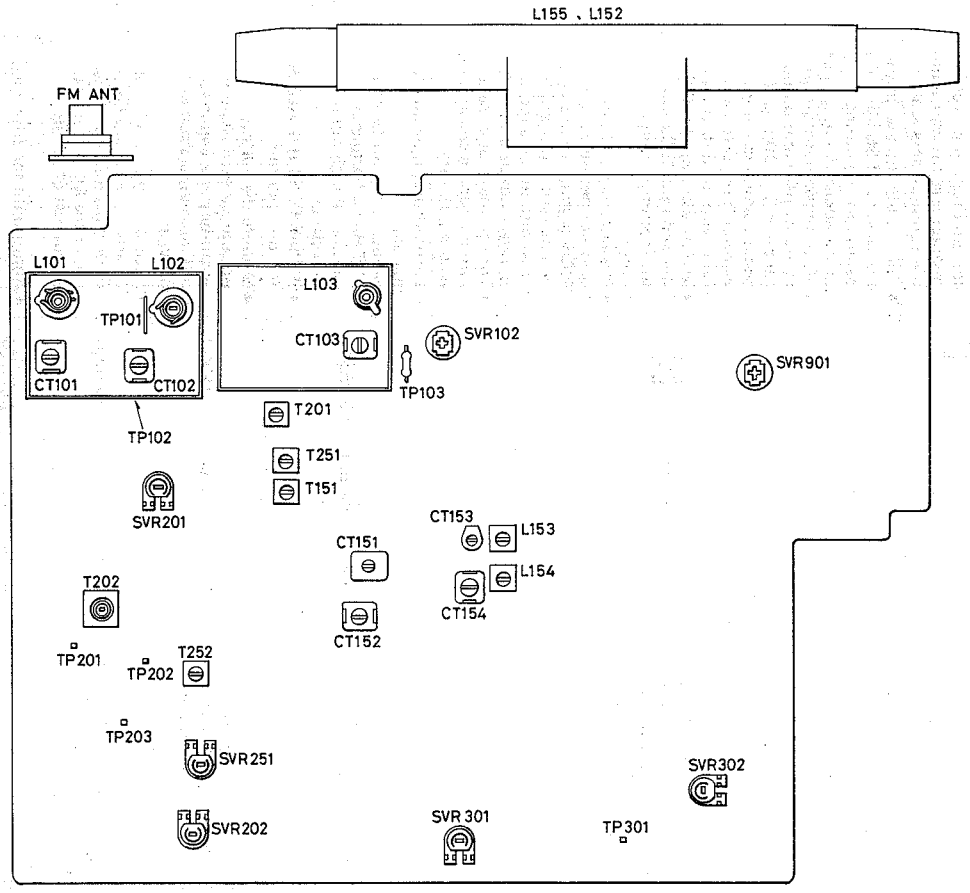
Standard modulation frequency, 1000 Hz;
frequency deviation, ±40 kHz dev.

Step	Adjustment circuit			Position of tuning dial	Input conditions for measuring instrument: Measuring instrument (Frequency)	Input conditions for measuring instrument: Input strength	Input conditions for measuring instrument: Connecting point	Output conditions for measuring instrument: Measuring instrument	Output conditions for measuring instrument: Connecting point: Hot side	Output conditions for measuring instrument: Connecting point: Earth side	Adjustment	Adjustment procedure
1	IF		V curve	Low end (Where no incoming signals.)	FM Sweep generator 10.7 MHz* (Non modulation)	Low Input level	TP-101 (H), TP-102 (E).	Oscilloscope AC Vacuum-tube Volt-meter Distortion meter	TP202	TP203	T201	● * Match the frequency with the center of ceramic filter. ● Before adjusting, remove the ceramic capacitor of C216 (0.022μF), and keep it clear while adjusting; solder it again after adjustment.
			S curve						TP201	TP203	T202	● Adjust the S-curve to the IF center. ● Keep muting switch in OFF position.
2	Cover frequency	MANUAL	Varactor Voltage	Low end	–	–	–	Digital Volt meter	TP103	TP102	SVR102	● Push the manual button, and adjust to obtain 3.0V read on volt meter.
			High	High end	FM Signal generator 108.3 MHz	Proper	External FM-Antenna (75 ohm)	Oscilloscope AC Vacuum-tube Volt meter Distortion meter	OUTPUT Terminal		CT103	● Push the manual button, and adjust until the distortion factor becomes minimum with the output value the maximum.
			Low	Low end	FM Signal generator 87.4 MHz	Proper					L103	
		PRESET	Varactor Voltage	(Turn SVRs of FM1 to 8 to counter-clockwise limit.)	–	–	–	Digital Volt meter	TP103	TP102	SVR901	● Depress any one of FM Preset buttons FM1 ~ FM8, and adjust so that the reading of digital voltmeter becomes 3V.
			Low	(Turn SVRs of FM1 to 8 to counter-clockwise limit.)	FM Signal generator 87.4 MHz	Proper	External FM-Antenna (75 ohm)	Oscilloscope AC Vacuum-tube Volt meter Distortion meter	OUTPUT Terminal		–	● Do not carry out cover adjustment under the Preset condition.
			High	(Turn SVRs of FM1 to 8 to clockwise limit.	FM Signal generator 108.250 MHz	Proper					–	● Turn all preset SVRs of FM2 to 8 to counterclockwise limit, and turn on successively, and make sure 87.4 MHz of low frequency coverage can be received. ● Turn all preset SVRs of FM1 to 8 to clockwise limit, and check the high frequency coverage. ● The high cover of Preset Position becomes about 50 Hz lower than Manual.

3	Tracking	Low	90.0 MHz	FM Signal generator 90.000 MHz	Proper	External FM-Antenna (75 ohm)	Oscilloscope V.T.V.M Distortion meter	OUTPUT Terminal	L101 L102	• Tune in SG and the unit, and adjust so that the distortion factor becomes minimum at the maximum output value. (Manual)
		High	106.0 MHz	106.000 MHz	Proper				CT101 CT102	• Tune in SG and the unit, and adjust so that the distortion factor becomes minimum at the maximum output value. (Manual)
4	Distortion		Near 98.0 MHz	98.0 MHz (Non modulation)	60 dB	External FM-Antenna (75 ohm)	Oscilloscope V.T.V.M Distortion meter	OUTPUT Terminal	T201 T202	• Tune in SG and the unit in the vicinity of 98 MHz. To determine the tuning point, adjust the output of SG so that the distortion factor of the tuner output becomes 3 to 10%, and select a point where the waveform distorts identically in vertical direction. • Set the SG output to 60 dB, and turn T202 until the distortion is minimized. • If the distortion factor does not decrease, turn T201 slightly. In this case, do not turn it too much; otherwise the characteristics may not be attained. • Tune in again, and make sure the tuning deviation is within ±15 kHz.
5	MPX (VCO)		—	SG (Cut OFF) FM noise off limit	—	External FM-Antenna (75 ohm)	Frequency Counter	TP301	TP203	SVR302	• Turn off muting switch of the unit. • Adjust to obtain 19 kHz ±30 Hz on frequency counter of high input impedance. • FM MUTE/MODE switch to "on" position.
6	MPX (Separation)		Near 98.0 MHz	FM Signal Generator 98 MHz Stereo Modulator	66 dB	External FM-Antenna (75 ohm)	Osilloscope V.T.V.M Distortion meter	OUTPUT Terminal		SVR301	• Measure the voltage leakage for each channel separately and adjust for optimum separation and balance.
7	Muting		Near 98.0 MHz	98.0 MHz	25 dB	External FM-Antenna (75 ohm)	Oscilloscope V.T.V.M	OUTPUT Terminal		SVR201	• Receive in the vicinity of 98 MHz in FM, and adjust so that the muting is effective at the SG direct open graduation of 20 dB.
8	Signal indicator		Near 98.0 MHz	98.0 MHz	55 dB	External FM-Antenna (75 ohm)	Signal LED	OUTPUT Terminal		SVR202	• Adjust until the fifth LED is lit.

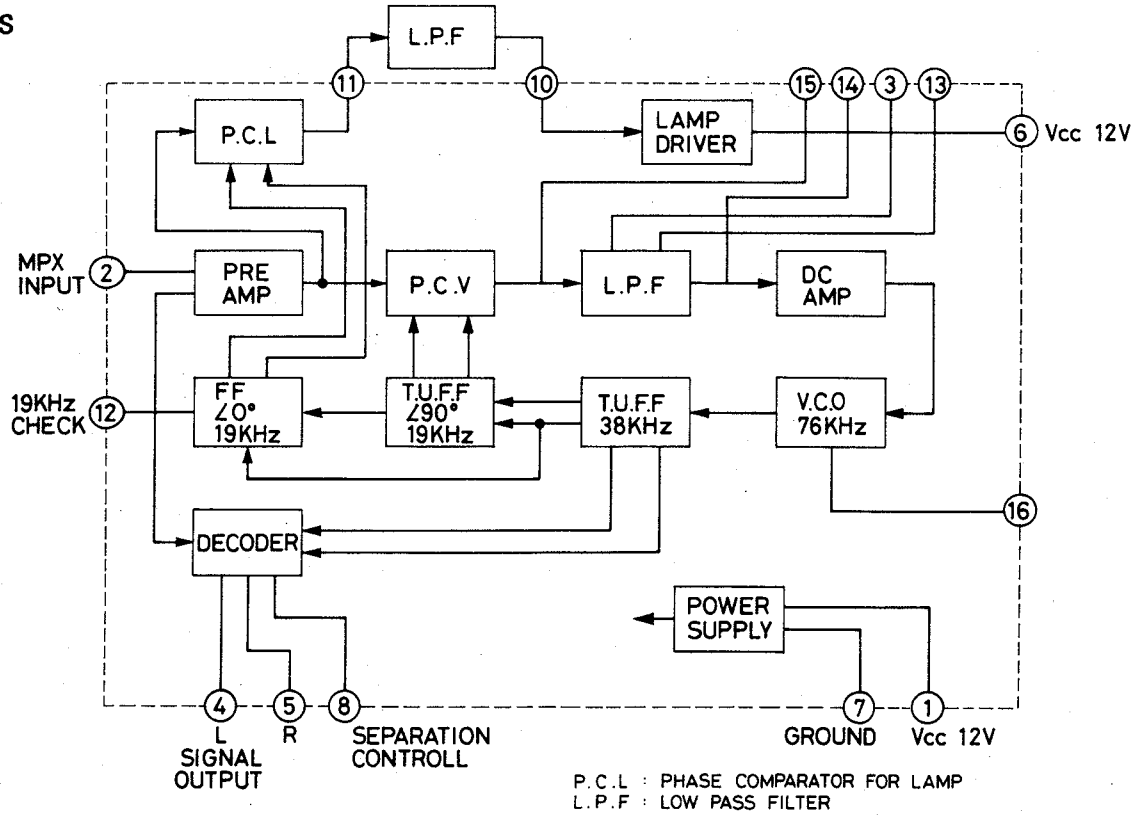
NOTES
1. The IF in item 4 refers to IF adjustment with SG, and is effective only when cover frequency and tracking are correctly adjusted.
2. Insert 75-ohm unbalanced dummy between SG and external FM antenna (75-ohm).
3. SG is directly connected and calibrated in open graduations.
4. Adjust the covery frequency precisely, and repeat IF and tracking adjustment two or three times.
5. Adjust on an iron plate.
6. Use nonmetallic screwdriver for adjustment.

PARTS LOCATION



IC BLOCK DIAGRAM

LA3350S

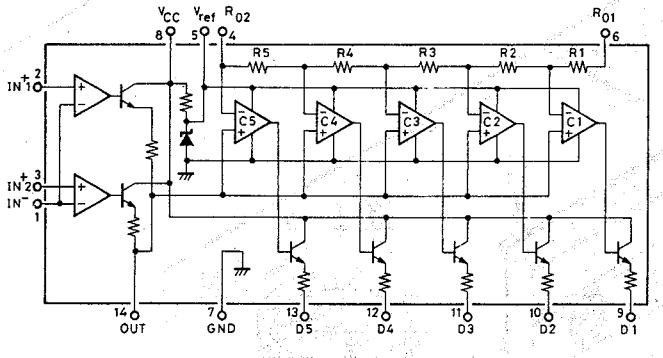


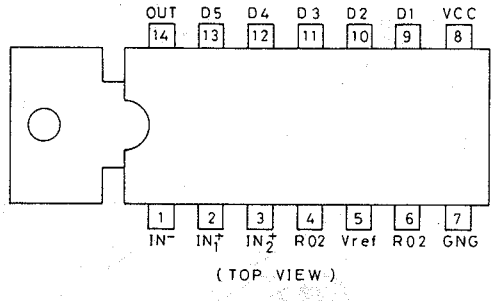
(PLL FM Multiplex Stereo Demodulator)

P.C.L : PHASE COMPARATOR FOR LAMP
L.P.F : LOW PASS FILTER
P.C.V : PHASE COMPARATOR FOR V.C.O
V.C.O : VOLTAGE CONTROLLED OSCILLATOR
T.U.F.F : DIRECT COUPLED TYPE FLIP-FLOP

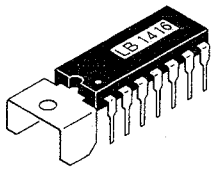
IC BLOCK DIAGRAM

LB1416 (5 DIGITS LEVEL METER DRIVER)

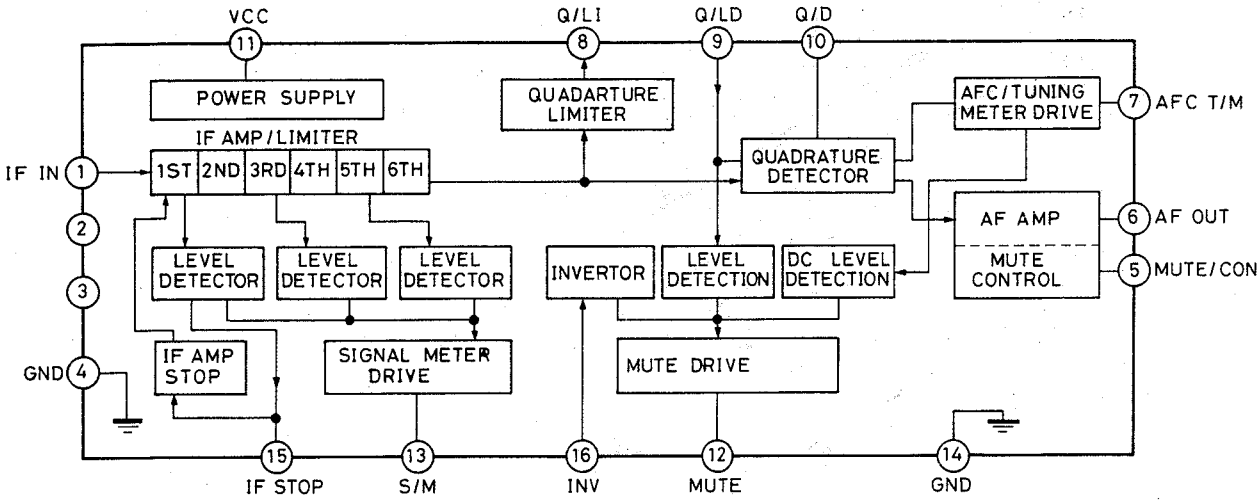


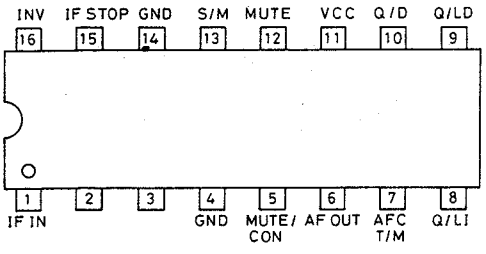


(TOP VIEW)

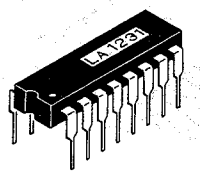


LA 1231 (FM IF SYSTEM)

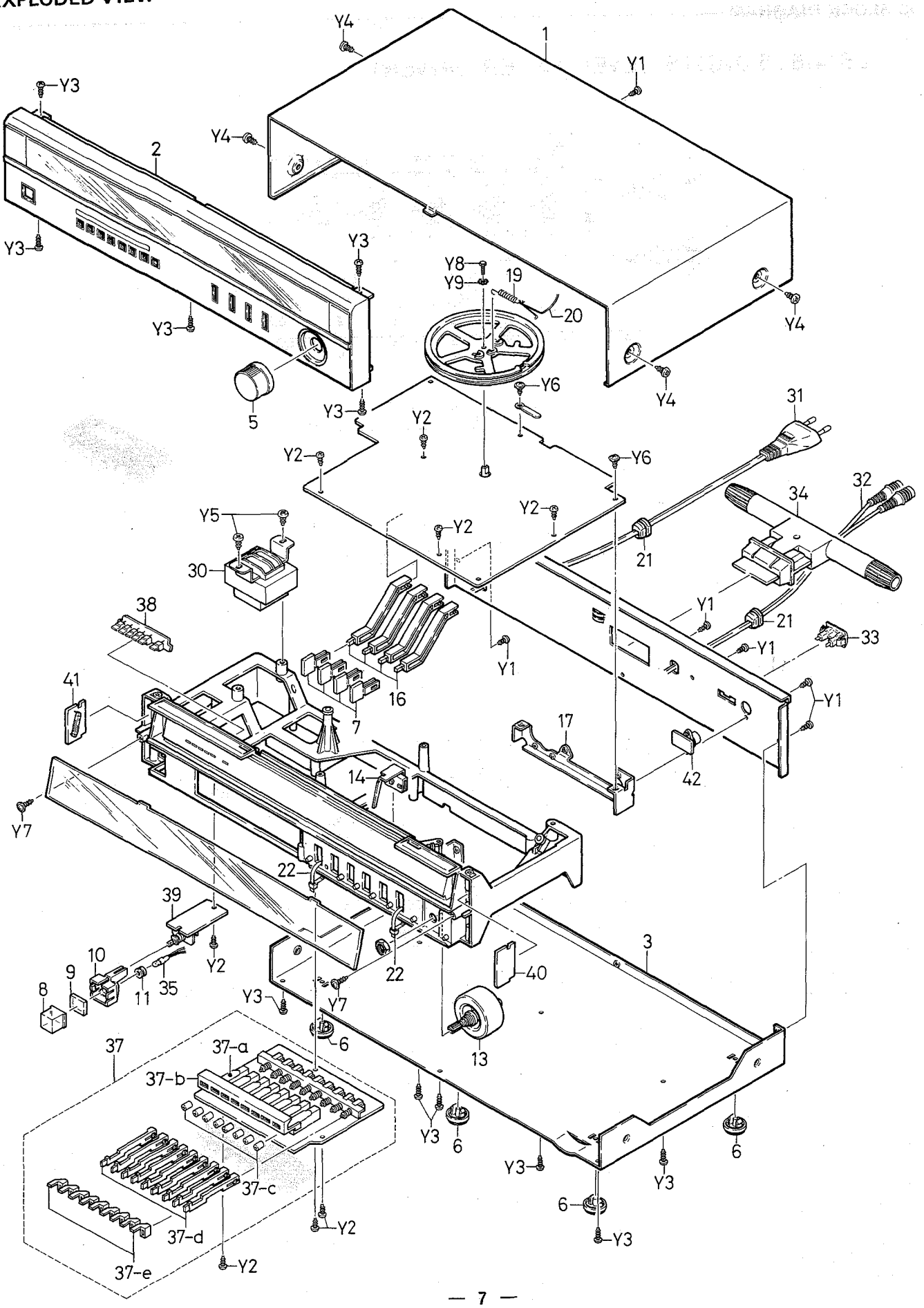




(TOP VIEW)



EXPLODED VIEW



PARTS LIST

Key No.	Part No.	Description	Q'ty
PACKING			
	141-6-133T-26300	Individual Carton	1
	141-6-144T-72900	Foam Plastic Case	2
	141-6-331T-11700	Protector Sheet	1
	141-6-231T-40550	Inner Polye Cover, Set	1
	141-6-231T-25350	Inner Polye Cover, Inst M	1
ACCESSORY			
	141-6-410T-63200	Instruction Manual	1
	141-6-415T-23500	Notice, Norwegian Inst. M	1
	141-2-198T-00200	Plastic Driver	1
	4-245T-00700	FM Antenna	1
CABINET & CHASSIS			
1	141-2-111T-48700	Cabinet	1
2	141-0-122T-39700	Front Panel Ass'y	1
3	141-2-125T-24600	Bottom Lid	1
4	141-2-126T-36600	Back Lid	1
5	141-2-163T-81300	Rotary Knob, Tuner	1
6	141-2-174T-12000	Stand	4
7	141-2-161T-98400	Push Button	4
8	141-2-132T-17100	Sign Window, Power Switch	1
9	141-2-135T-77200	Cover, Power Switch	1
10	141-2-161T-98200	Push Button, Power Switch	1
11	141-2-445T-08701	Rubber Cushion	1
12	141-0-311T-38600	Chassis Ass'y	1
13	141-0-566T-11700	Tuning Shaft Ass'y	1
14	141-0-511T-21800	Pointer Ass'y	1
15	141-2-146T-27600	Dial Scale	1
16	141-2-253T-27900	Joint	4
17	141-2-310T-62900	Bracket, PCB	1
18	141-2-538T-12500	Drum	1
19	141-2-851T-06300	Spring Coil	1
20	141-2-340T-05003	Rope	1
21	141-2-464T-14400	Fixer	2
22	141-2-464T-20671	Fixer	2
HARDWARE			
Y1		Binding Head Tapping Screw 3x8mm	6
Y2		Binding Head Tapping Screw 3x10mm	8
Y3		Binding Head Tapping Screw 3x12mm	9
Y4		Binding Head Tapping Screw 4x8mm	4
Y5		Binding Head Tapping Screw 4x10mm	2
Y6		Pan Hd. Tapping Screw w/Washer 3x8mm	2
Y7		Pan Hd. Tapping Screw w/Washer 3x12mm	2
Y8		Hexagon Head Bolt 2.6x6mm	1
Y9		TH. Lock Washer 2.6mm	1
ELECTRICAL PARTS			
30	4-300T-36800	Power Trans (T901)	1
31	4-243T-83200	Power Cord	1
32	4-243T-19700	Lead Cord	1
33	4-235T-44500	Socket	1
34	4-257T-44101	Antenna Coil Ass'y	1
35	4-612T-16300	Lamp 0.1A 8V	1

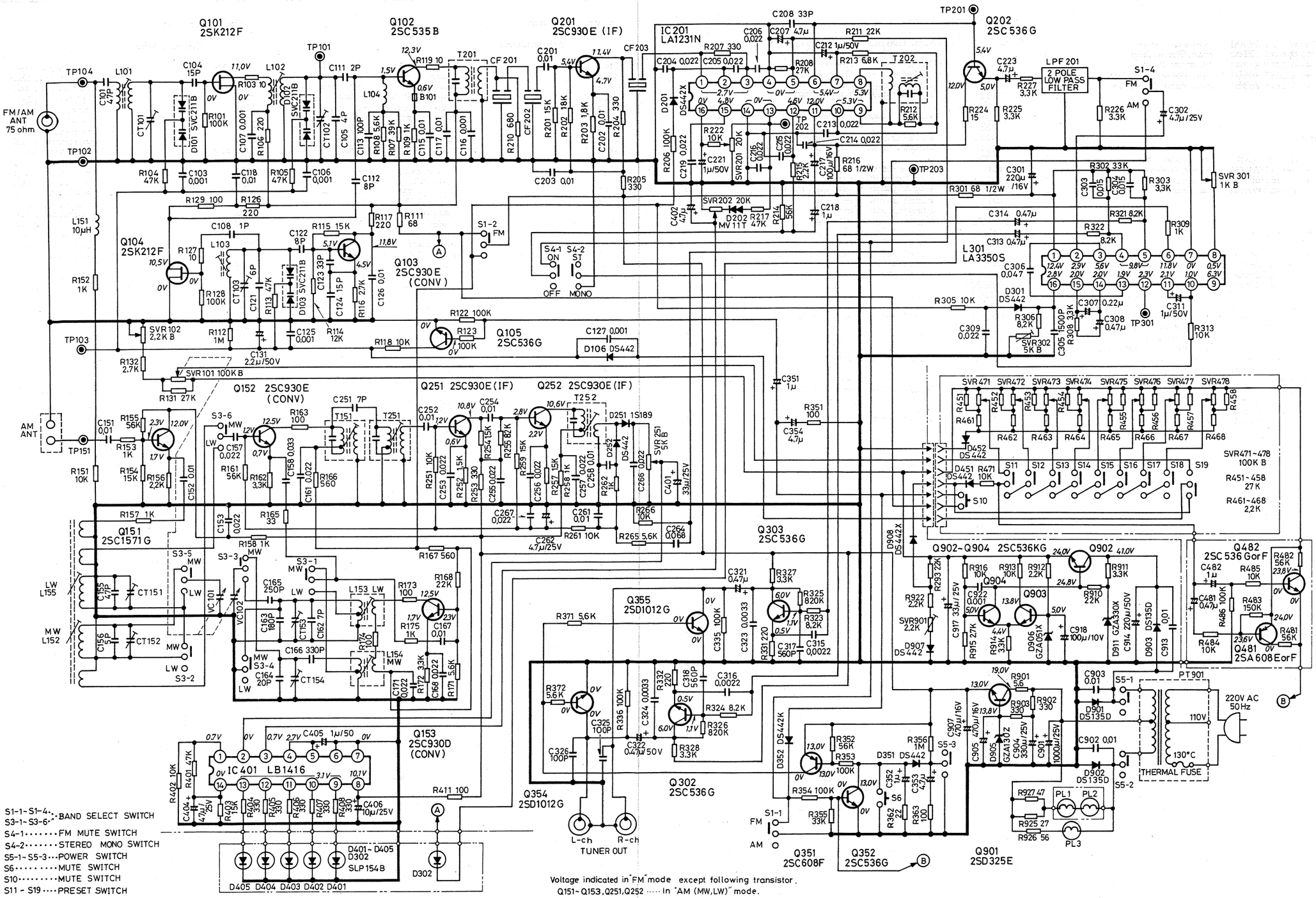
Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
36	141-4-250T-00100	P.C Board Ass'y, Tuner	1
	4-224T-17601	Variable Capacitor	1
	141-2-322T-49400	Shield Plate	2
	141-2-322T-40800	Shield Plate	1
	4-238T-24800	Push Switch, Function	1
CT152 154	4-224R-11600	Trimmer, MW	2
CT151 153	4-224T-15400	Trimmer, LW	2
CT103	4-224T-08800	Trimmer, FM HC	1
CT101 102	4-224R-11600	Trimmer, FM ANT RF	2
B101	123-2-471R-10900	Core	1
L101	4-265T-53840	VHF Coil, FM ANT	1
L102	4-265T-55930	VHF Coil, FM RF	1
T201	4-256T-05140	IFT, FM	1
T202	4-256T-21740	IFT, FM	1
T151,251	4-256T-04140	IFT, AM	2
T252	4-256T-03740	IFT, AM	1
L154	4-258T-28640	OSC Coil, MW	1
L153	4-258T-28840	OSC Coil, LW	1
F201	4-255T-02900	MX Coil	1
CF201 202,203	4-256T-81090	IF Filter	3
SVR302	4-222T-81474	Semifixed Variable Resistor 5K	1
SVR251	4-222T-81474	Semifixed Variable Resistor 5K	1
SVR202	4-222T-81476	Semifixed Variable Resistor 20K	1
SVR901	4-222T-73575	Semifixed Variable Resistor 2.2K-B	1
SVR102	4-222T-73575	Semifixed Variable Resistor 2.2K-B	1
SVR301	4-222T-81472	Semifixed Variable Resistor 1K	1
SVR201	4-222T-81476	Semifixed Variable Resistor 20K	1
L104	4-253T-12714	Filter 3.3μH	1
L151	4-253T-12720	Filter	1
	4-236T-19775	Plug	1
	4-236T-10275	Plug	1
Q101		Transistor 2SK212	1
Q102		Transistor 2SC535	1
Q103		Transistor 2SC930 Conv.	1
Q201		Transistor 2SC930 IF	1
Q153		Transistor 2SC930 Conv.	1
Q152		Transistor 2SC930 Conv.	1
Q251,252		Transistor 2SC930 IF	2
Q151		Transistor 2SC1571	1
Q202		Transistor 2SC536	1
Q302,303		Transistor 2SC536	2
Q105		Transistor 2SC536	1
Q352		Transistor 2SC536	1
Q902,903 904		Transistor 2SC536K	3
Q351		Transistor 2SA608	1
Q344,355		Transistor 2SD1012	2
Q901		Transistor 2SD325	1
Q104		Transistor FET 2SK212	1
IC201		IC LA1231N	1
IC301		IC LA3350S	1
IC401		IC LB1416	1
D905		Zener Diode GZA13Z	1
D906		Zener Diode GZA5.1X	1
D911		Zener Diode GZA33X	1
D251		Diode 1S189	1
D901,902 903		Diode DS135 D	3
D202		Varystor MV11T	1
D252		Diode DS442 X	1
D106,201 301,351		Diode DS442 X	4
D101		Varactor Diode SVC211B SP	1
D102,103		Varactor Diode SVC211B SP	2
D907,908		Diode DS442 X	2
D352		Diode DS442 X	1

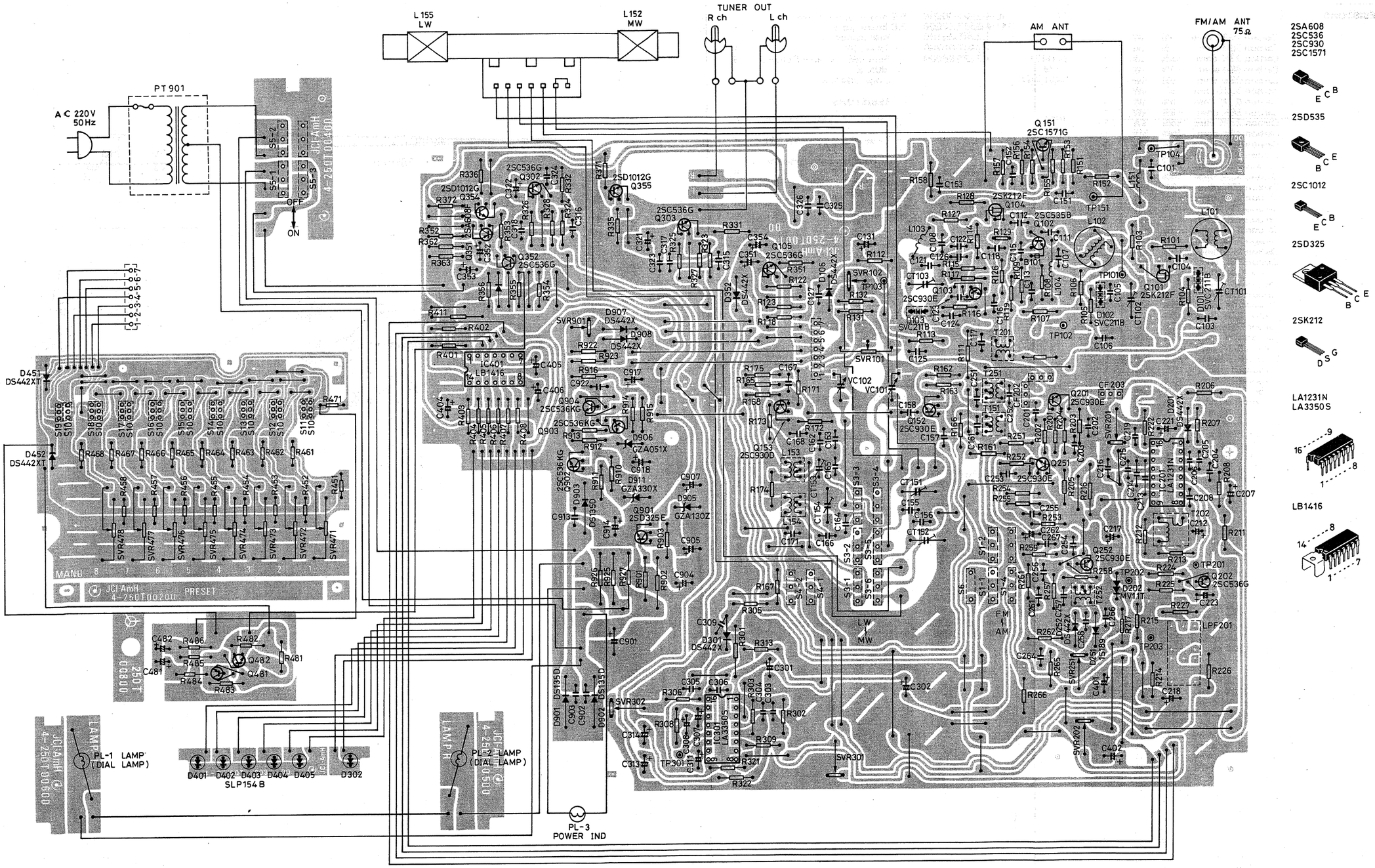
PARTS LIST

Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
	CAPACITORS		
C101		Ceramic 47pF 50V ±10%	1
C103		Ceramic 0.001μF 50V ±10%	1
C104		Ceramic 15pF 50V ±10%	1
C105		Ceramic 4pF 50V ±0.25pF	1
C106		Ceramic 0.001μF 50V ±10%	1
C107		Ceramic 0.001μF 50V ±10%	1
C108		Ceramic 1pF 50V ±0.25pF	1
C111		Ceramic 2pF 50V ±0.25pF	1
C112		Ceramic 8pF 50V ±0.25pF	1
C113		Ceramic 100pF 50V ±10%	1
C115		Ceramic 0.01μF 50V +80—20%	1
C116		Ceramic 0.001μF 50V ±10%	1
C117		Ceramic 0.01μF 50V +80—20%	1
C118		Ceramic 0.01μF 50V +80—20%	1
C121		Ceramic 6pF 50V ±0.25pF	1
C122		Ceramic 8pF 50V ±0.25pF	1
C123		Ceramic 33pF 50V ±5%	1
C124		Ceramic 15pF 50V ±5%	1
C125		Ceramic 0.001μF 50V ±10%	1
C126		Ceramic 0.01μF 50V +80—20%	1
C127		Ceramic 0.001μF 50V ±10%	1
C201,202, 203		Ceramic 0.01μF 50V +80—20%	3
C204,205 206		Ceramic 0.022μF 50V +80—20%	3
C208		Ceramic 33pF 50V ±10%	1
C213,214 215,216		Ceramic 0.022μF 50V +80—20%	4
C219		Ceramic 0.022μF 50V +80—20%	1
C309		Ceramic 0.022μF 50V +80—20%	1
C153		Ceramic 0.022μF 50V +80—20%	1
C161		Ceramic 0.022μF 50V +80—20%	1
C171		Ceramic 0.022μF 50V +80—20%	1
C155		Ceramic 47pF 50V ±10%	1
C156		Ceramic 5pF 50V ±0.25pF	1
C162		Ceramic 7pF 50V ±0.25pF	1
C164		Ceramic 20pF 50V ±5%	1
C163		Ceramic 180pF 50V ±5%	1
C251		Ceramic 7pF 50V ±0.25pF	1
C902,903 913		Ceramic 0.01μF 50V +80—20%	3
C922		Ceramic 0.001μF 50V ±10%	1
C325,326		Ceramic 100pF 50V ±10%	2
C317,318		Ceramic 560pF 50V ±10%	2
C151		BC CON 0.01μF 25V ±20%	1
C152		BC CON 0.01μF 25V ±20%	1
C157		BC CON 0.022μF 25V ±20%	1
C158		BC CON 0.033μF 25V ±20%	1
C167		BC CON 0.01μF 25V ±20%	1
C168		BC CON 0.022μF 25V ±20%	1
C252		BC CON 0.01μF 25V ±20%	1
C253		BC CON 0.022μF 25V ±20%	1
C254		BC CON 0.01μF 25V ±20%	1
C255,256 257		BC CON 0.022μF 25V ±20%	3
C258		BC CON 0.01μF 25V ±20%	1
C261		BC CON 0.022μF 25V ±20%	1
C267		BC CON 0.01μF 25V ±20%	1
C266		BC CON 0.022μF 25V ±20%	1
C264		BC CON 0.068μF 25V ±20%	1
C303,304		BC CON 0.015μF 25V ±20%	2
C306		BC CON 0.047μF 25V ±10%	1
C315,316		BC CON 0.0022μF 25V ±10%	2
C323,324		BC CON 0.0033μF 25V ±10%	2
C165		Styrol 250pF 50V ±5%	1
C305		P P CON 0.0015μF 100V ±5%	1
C166		Styrol 310pF 50V ±5%	1
C901		Electrolytic 1000μF 25V	1
C904		Electrolytic 330μF 25V	1

Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
	CAPACITORS		
C905,907		Electrolytic 470μF 16V	2
C914		Electrolytic 220μF 50V	1
C918		Electrolytic 100μF 10V	1
C917		Electrolytic 33μF 25V	1
C352		Electrolytic 2.2μF 25V	1
C353		Electrolytic 4.7μF 50V	1
C351		Electrolytic 1μF 25V	1
C354		Electrolytic 4.7μF 50V	1
C313,314		Electrolytic 0.47μF 25V	2
C321,322		Electrolytic 0.47μF 25V	2
C131		Electrolytic 0.47μF 50V	1
C217		Electrolytic 100μF 16V	1
C207		Electrolytic 4.7μF 25V	1
C212		Electrolytic 1μF 25V	1
C223		Electrolytic 4.7μF 25V	1
C302		Electrolytic 4.7μF 25V	1
C218,221		Electrolytic 1μF 25V	2
C301		Electrolytic 220μF 16V	1
C311		Electrolytic 1μF 25V	1
C308		Electrolytic 0.47μF 25V	1
C307		Electrolytic 0.22μF 50V	1
C402		Electrolytic 4.7μF 25V	1
C401		Electrolytic 33μF 25V	1
C404		Electrolytic 4.7μF 25V	1
C405		Electrolytic 1μF 25V	1
C406		Electrolytic 10μF 25V	1
	RESISTORS		
R101		Carbon 100K ohm ±5% ¼W	1
R103		Carbon 10 ohm ±5% ¼W	1
R104		Carbon 47K ohm ±5% ¼W	1
R105		Carbon 47K ohm ±5% ¼W	1
R106		Carbon 220 ohm ±5% ¼W	1
R107		Carbon 39K ohm ±5% ¼W	1
R108		Carbon 5.6K ohm ±5% ¼W	1
R109		Carbon 1K ohm ±5% ¼W	1
R112		Carbon 1M ohm ±5% ¼W	1
R113		Carbon 47K ohm ±5% ¼W	1
R114		Carbon 12K ohm ±5% ¼W	1
R115		Carbon 15K ohm ±5% ¼W	1
R116		Carbon 2.7K ohm ±5% ¼W	1
R117		Carbon 220 ohm ±5% ¼W	1
R118		Carbon 10K ohm ±5% ¼W	1
R119		Carbon 10 ohm ±5% ¼W	1
R122		Carbon 100K ohm ±5% ¼W	1
R123		Carbon 100K ohm ±5% ¼W	1
R126		Carbon 220 ohm ±5% ¼W	1
R127		Carbon 10 ohm ±5% ¼W	1
R128		Carbon 100K ohm ±5% ¼W	1
R129		Carbon 100 ohm ±5% ¼W	1
R131		Carbon 27K ohm ±5% ¼W	1
R132		Carbon 2.7K ohm ±5% ¼W	1
R151		Carbon 10K ohm ±5% ¼W	1
R152		Carbon 1K ohm ±5% ¼W	1
R153		Carbon 1K ohm ±5% ¼W	1
R154		Carbon 15K ohm ±5% ¼W	1
R155		Carbon 56K ohm ±5% ¼W	1
R156		Carbon 2.2K ohm ±5% ¼W	1
R157		Carbon 1K ohm ±5% ¼W	1
R158		Carbon 1K ohm ±5% ¼W	1
R161		Carbon 56K ohm ±5% ¼W	1
R162		Carbon 3.3K ohm ±5% ¼W	1
R165		Carbon 33 ohm ±5% ¼W	1
R166		Carbon 560 ohm ±5% ¼W	1
R167		Carbon 560 ohm ±5% ¼W	1
R168		Carbon 22K ohm ±5% ¼W	1
R171		Carbon 5.6K ohm ±5% ¼W	1
R172		Carbon 3.3K ohm ±5% ¼W	1
R173		Carbon 100 ohm ±5% ¼W	1
R174		Carbon 100 ohm ±5% ¼W	1
R175		Carbon 1K ohm ±5% ¼W	1
R201		Carbon 15K ohm ±5% ¼W	1
R202		Carbon 18K ohm ±5% ¼W	1
R203		Carbon 1.8K ohm ±5% ¼W	1
R204		Carbon 330 ohm ±5% ¼W	1
R205		Carbon 330 ohm ±5% ¼W	1

SCHEMATIC DIAGRAM



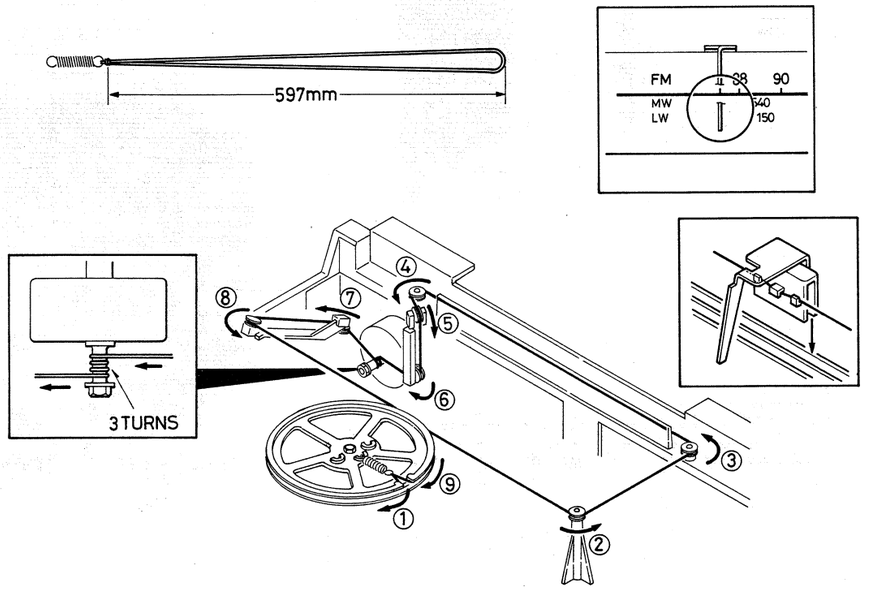

L155 LW
L152 MW
TUNER OUT
R ch
L ch
AM ANT
FM/AM ANT 75Ω
PT901
AC 220V 50Hz
S5-1
S5-2
S5-3
OFF
ON
Q151 2SC1571G
2SA608
2SC536
2SC930
2SC1571
2SD535
2SC1012
2SD325
2SK212
LA1231N
LA3350S
LB1416
PL-1 LAMP (DIAL LAMP)
PL-2 LAMP (DIAL LAMP)
PL-3 POWER IND
D401 D402 D403 D404 D405
SLP154B
D302
PRESET
MANU
LW
MW
FM
AM

PARTS LIST

Key No.	Part No.	Description	Q'ty
TUNER PCB ASS'Y			
	RESISTORS		
R206		Carbon 100K ohm ±5% ¼W	1
R207		Carbon 330 ohm ±5% ¼W	1
R208		Carbon 27K ohm ±5% ¼W	1
R210		Carbon 680 ohm ±5% ¼W	1
R211		Carbon 22K ohm ±5% ¼W	1
R212		Carbon 5.6K ohm ±5% ¼W	1
R213		Carbon 6.8K ohm ±5% ¼W	1
R214		Carbon 56K ohm ±5% ¼W	1
R215		Carbon 2.2K ohm ±5% ¼W	1
R217		Carbon 47K ohm ±5% ¼W	1
R224		Carbon 15 ohm ±5% ¼W	1
R225		Carbon 3.3K ohm ±5% ¼W	1
R226		Carbon 5.6K ohm ±5% ¼W	1
R227		Carbon 3.3K ohm ±5% ¼W	1
R251		Carbon 10K ohm ±5% ¼W	1
R252		Carbon 1.5K ohm ±5% ¼W	1
R253		Carbon 330 ohm ±5% ¼W	1
R254		Carbon 1.5K ohm ±5% ¼W	1
R255		Carbon 82K ohm ±5% ¼W	1
R257		Carbon 1.5K ohm ±5% ¼W	1
R258		Carbon 1K ohm ±5% ¼W	1
R259		Carbon 15K ohm ±5% ¼W	1
R261		Carbon 10K ohm ±5% ¼W	1
R262		Carbon 1K ohm ±5% ¼W	1
R265		Carbon 5.6K ohm ±5% ¼W	1
R266		Carbon 10K ohm ±5% ¼W	1
R302		Carbon 3.3K ohm ±5% ¼W	1
R303		Carbon 3.3K ohm ±5% ¼W	1
R305		Carbon 10K ohm ±5% ¼W	1
R306		Carbon 8.2K ohm ±5% ¼W	1
R308		Carbon 3.3K ohm ±5% ¼W	1
R309		Carbon 1K ohm ±5% ¼W	1
R313		Carbon 10K ohm ±5% ¼W	1
R321		Carbon 8.2K ohm ±5% ¼W	1
R322		Carbon 8.2K ohm ±5% ¼W	1
R323		Carbon 8.2K ohm ±5% ¼W	1
R324		Carbon 8.2K ohm ±5% ¼W	1
R325		Carbon 820K ohm ±5% ¼W	1
R326		Carbon 820K ohm ±5% ¼W	1
R327		Carbon 3.3K ohm ±5% ¼W	1
R328		Carbon 3.3K ohm ±5% ¼W	1
R331		Carbon 220 ohm ±5% ¼W	1
R332		Carbon 220 ohm ±5% ¼W	1
R335		Carbon 100K ohm ±5% ¼W	1
R336		Carbon 100K ohm ±5% ¼W	1
R371		Carbon 5.6K ohm ±5% ¼W	1
R372		Carbon 5.6K ohm ±5% ¼W	1
R351		Carbon 100 ohm ±5% ¼W	1
R352		Carbon 56K ohm ±5% ¼W	1
R353		Carbon 100K ohm ±5% ¼W	1
R354		Carbon 100K ohm ±5% ¼W	1
R355		Carbon 33K ohm ±5% ¼W	1
R362		Carbon 22 ohm ±5% ¼W	1
R363		Carbon 100 ohm ±5% ¼W	1
R401		Carbon 47K ohm ±5% ¼W	1
R402		Carbon 10K ohm ±5% ¼W	1
R403		Carbon 15K ohm ±5% ¼W	1
R404,405 406,407 408		Carbon 330 ohm ±5% ¼W	5
R903		Carbon 330 ohm ±5% ¼W	1
R910		Carbon 22K ohm ±5% ¼W	1
R911		Carbon 3.3K ohm ±5% ¼W	1
R912		Carbon 2.2K ohm ±5% ¼W	1
R913		Carbon 10K ohm ±5% ¼W	1
R914		Carbon 3.3K ohm ±5% ¼W	1
R915		Carbon 2.7K ohm ±5% ¼W	1
R922		Carbon 2.2K ohm ±5% ¼W	1
R923		Carbon 22K ohm ±5% ¼W	1
R111		Carbon 68 ohm ±10% ½W	1
R216		Carbon 68 ohm ±10% ½W	1
R301		Carbon 68 ohm ±10% ½W	1
R411		Solid 100 ohm ±10% ½W	1
R902		Solid 330 ohm ±10% ½W	1
R927		Solid 47 ohm ±10% ½W	1
R025		Solid 27 ohm ±10% ½W	1
R926		Solid 56 ohm ±10% ½W	1
R901		FP-Carbon 5.6 ohm ±5% ¼W	1

Key No.	Part No.	Description	Q'ty
PRESET PCB ASS'Y			
37	140-4-250T-00200	P.C Board Comp. Preset	1
	141-4-250T-00200	P.C Board Ass'y	1
	4-238T-35100	├Push Switch	1
	4-240T-08700	├Socket 8P	1
SVR471 ~478	4-222T-96000	├Semifixed Variable Resistor 100K-B	8
D451,452		├Diode DS442X	2
		RESISTORS	
R451 ~458		├Carbon 27K ohm ±5% ¼W	8
R461 ~468		├Carbon 2.2K ohm ±5% ¼W	8
R471		└Carbon 10K ohm ±5% ¼W	1
37-a	141-2-246T-93700	Sheet	8
37-b	141-2-210T-32300	Bracket	1
37-c	141-2-163T-81400	Rotary Knob	8
37-d	141-2-253T-28900	Joint	9
37-e	141-2-161T-94400	Push Button	9
SIGNAL LED PCB ASS'Y			
38	141-4-250T-00300	P.C Board Ass'y, Signal LED	1
D401,402 403,404 405		LED SLP154B Red	5
D302		LED SLP154B Red	1
	4-240T-08700	Socket 8P	1
AC SWITCH PCB ASS'Y			
39	141-4-250T-00400	P.C Board Ass'y, AC Switch	1
	4-238T-35000	Push Switch	1
LAMP R PCB ASS'Y			
40	141-4-250T-00500	P.C Board Ass'y, Lamp R	1
	4-612T-13272	Lamp 100mA 8V	1
LAMP L PCB ASS'Y			
41	141-4-250T-00600	P.C Board Ass'y, Lamp L	1
	4-612T-13272	Lamp 100mA 8V	1
FM ANT PCB ASS'Y			
42	141-4-250T-00700	P.C Board Ass'y, FM ANT	1
	4-235T-56500	Socket	1

DIAL CORD STRINGING



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